

Health Update

Ozone and PM2.5 Cause Symptoms in Children with Asthma

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California Environmental Protection



Air Resources Board

“Association of Low-Level Ozone and Fine Particles With Respiratory Symptoms in Children With Asthma”

Janneane Gent, et al., JAMA, 290, pages 1859-1867 (2003)

- Objective
 - To examine effects of ozone and PM_{2.5} at levels below EPA standards and symptoms and medication use in children with asthma

Study Details

- 270 young asthmatic children recruited in New England---80% Caucasian
- Half took at least occasional “maintenance” medication, half took none
- Symptoms and “rescue” medication use evaluated April through September 2001
- Ozone and PM 2.5 levels during study were low
 - Federal 1-hour ozone standard (120 ppb) violated 3 times
 - Federal 8-hour ozone standard (80 ppb) violated 10 times
 - Federal 24-hour PM_{2.5} standard (65 µg/m³) was not violated

Study Findings

- General health observations

Kids using “maintenance” medication had more severe asthma

- They had more respiratory symptoms (chest tightness, shortness of breath, cough and/or wheeze)
- They used more “rescue” medication for relief

Study Findings (cont.)

Responses in “severe” asthmatics

- **When same day ozone levels were above**
 - 51 ppb (1-hr)---more wheeze, bronchodilator use
 - 63 ppb (8-hr)---more chest tightness
- **When prior day ozone levels were above**
 - 52 ppb (1-hr)---more chest tightness
 - 59 ppb (1-hr)---more shortness of breath
 - 72 ppb (1-hr)---more persistent coughs
 - 52 ppb (8-hr)---more chest tightness, cough, shortness of breath

Study Findings (cont.)

- Same day PM_{2.5} levels
 - Few effects found
- When prior day PM_{2.5} levels were
 - 19 µg/m³ or higher---more cough, chest tightness, shortness of breath

Responses in less “severe” asthmatics

- Ozone
 - Almost no effects detected
- PM_{2.5}
 - Almost no effects detected

Implications and Applications

- Adds to existing knowledge about ozone
- Suggests that ozone increases medication use
- Meds don't make asthmatic kids immune to ozone
- Will be considered in ozone standards review
- Do not view PM2.5 as harmless to asthmatic kids